Improving
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Teaching

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IMPROVING COLLEGE AND UNIVERSITY TEACHING

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The Editor's Uneasy Chair

In the spring "a host of golden daffodils" is a thrilling sight—a dancing mass of color. To the gardener tending them they doubtless have been merely a bed of bloom, though really, as in nature generally, each flower is different from any other, each one beautiful but "no two alike." Crocuses, violets, or tulips are grown in the mass as though they were all alike. In teaching college students we commonly do the same. We say we realize that each student is different from each of the others, but of course when we have so many we have to treat them as though they were alike. This seems fair enough, so neither we nor others question it.

"No Two Alike"

But it must certainly be all wrong. Growing narcissi and teaching college students cannot be very analogous. Students are so much more complex, and our teaching goals so much greater, both qualitatively and quantitatively, than those of a floriculturist that if we and he are following a similar pattern of procedure something is wrong.

Macroscopic perceptions readily deceive us. A drop of water, sparkling to the eye, may appear under the microscope to teem with germs. In looking at our classes we see differences we can disregard: sex, complexion, eyes with and without glasses. Tests, however, reveal differences that should concern us. For example, if in an overall test covering the work of a course 22% of the students can score at the beginning of the term as high or higher than the passing level for the course, the situation would appear something not to be ignored. But are pretests commonly given? Or when given, is the instruction differentiated according to the results found?

Individualization is not an end in itself but rather a means of achieving ends that can only be achieved in that way.

In a period when increasing numbers of students make the task of individualized teaching seem increasingly difficult, perhaps impossible, the need for individualized teaching is really greater than ever. It is time the task was faced. That students must be taught as individuals is a basic fact. Perhaps individualization may not be as difficult as we think. College and university teachers are able, purposeful, and resourceful. If they ever undertake to individualize their teaching, they probably will find ways to do it.

Editorial

In Loco Parentis

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IN THE RELATION of parents and child all human institutions exist in epitome like the plant in the seed. The word ECONOMY quite properly derives from the Greek word for house or home. Home life provides the pattern for institutions. Public servants are the counterparts of stewards of the household. Teachers are the counterparts of parents. The idea that teachers work in loco parentis is as true philosophically as legally.

Both parents and teachers operate according to many differing theories. Authoritarians depend upon a long regime of telling the child what to do and seeing that he does it with the expected result that he will thus develop the right kind of character and habits for a good life. Others with an opposite philosophy highly regard the innate dynamic of individual personality, unfolding and developing in its own way and requiring only watchful care and occasional help and guidance. Between the extremes of prescription and permissiveness are all varieties of mingled theory and practice, not all good.

Just now we are viewing our whole educational scheme with some alarm. We are alert to discover its faults and to correct them. Have we too much permissiveness, we are asking, and do we need more compulsion as to courses and standards? While permissiveness is being examined, we should note that it does not mean laissez faire. Letting nature take its course would hardly be applied where a child's teeth need orthodontic correction. Only irresponsible parents and teachers, whatever their philosophy, will fail to interpose overt measures where needed even though the emphasis is permissive. Probably we shall have an increase of authoritarian education, but we had better not wholly discard permissiveness as though it were wholly bad.

A couple of years ago in a personal letter I congratulated a friend and his wife on their four mature sons: artist, chemist, clergyman, lawyer. In reply he thanked me for the praise and wrote: "The boys knew always that it was up to them to develop their own individual potentiality. The only real set up we had for them was a sympathetic environment. We proposed never to lead them. Our guidance was from the rear. They used their own headlights. We exercised a conscious effort that each must choose his own life work. Allowing for exceptions to all rules, we are fortunate believing our method worked."

These few lines are not a package pedagogy, but are they not packed with significance? Certainly there are phrases for teachers to ponder: "They knew always that it was up to them." "To develop their own individual potentiality." "A sympathetic environment." "Our guidance was from the rear." "They used their own headlights."

"Their own headlights"—perhaps that is the most striking idea of all. What a delight to a teacher when his students provide their own headlights. What a test of teaching when students do, or do not, provide their own headlights. Teaching is a joy when students are motivated. Teaching is skilled teaching when they are. Is not the very secret of teaching—the "knack" that born teachers somehow just have, the skill that good teachers somehow acquire—essentially the awakening of students?

Cannot any teacher gain help from the philosophy which my friends followed successfully with their four sons? Do I as teacher think of myself as the bearer of a flaming torch, leading an academic procession of my students along the way of knowledge? Or do I see myself more as guiding from the rear? Do I see the real light of my classroom as a galaxy of my students' own "headlights," my own torch perhaps a polar factor but not too conspicuous?

The greatness of Thomas Arnold showed itself in his principle that his chief business was to impart "not knowledge, but the appetite for knowledge." *Appetite for knowledge:* is not that what the "headlights" mean?

The Good Teacher

A discerning and inspiring conception of teaching at its finest was expressed last November at the inauguration of Dr. Richard Glenn Gettell as President of Mount Holyoke College. Copy of the address was obtained by Dr. Ordway Tead and is here presented with the gracious approval of the author. Dr. Van Doren (A.B., A.M., Illinois; Ph.D., Columbia; Litt.D., Bowdoin) is professor of English at Columbia, has been a contributor to literature and education over a long period, and is so distinguished as poet and teacher as to require no introduction to our readers.

By MARK VAN DOREN

THE WORDS of a teacher bear so many responsibilities that if all of them were ever present in his mind together he would grow as silent as the grave.

The teacher's responsibility to the student is so huge and heavy a thing that no teacher in his right mind considers it at all. No good teacher, I mean. For a good teacher has had the experience of learning that his words have an effect upon those who sit before him: an effect, it may be, that will endure for decades and, in certain cases, given enough age in the teacher, have indeed endured that long. And it may gratify him to be told of this.

But if he commenced each of his classes by wondering what future actions or thoughts were going to be the result of what he said, if he asked himself seriously what characters he was going to shape, if ever so oddly or so little, he might be terrified before he spoke one word. Normally he is blessed with a healthy indifference to such considerations. He is concerned with what he is going to say, and with whether or not it is true.

I SCARCELY NEED to explain that the kind of teacher I have in view is the kind for whom the subject was created. It is his subject; he spends his life thinking about it, whether in or out of class; it is his second if not his first nature; it is what gives him joy. No student ever fails to be aware of this.

A teacher can fool his colleagues; he may even fool his president; but he never fools his students. They know when he loves his subject and when he does not.

They may think such love to be a queer thing, and they may resolve never to fall victim to it themselves; but their respect for it will never cease. And respect for a subject, like respect for an idea, is the beginning of wisdom; or, at the very least, respect for the love of a subject.

THE TEACHER'S responsibility to his subject is so serious a thing that it of course precludes anything like a parade of personality for its own sake. The good teacher is not trying to be a personality: he is trying to be a person who understands his subject and sinks himself into it. If he could, he would disappear there altogether . . .

The whimsical teacher, who cares only to impress his brilliance upon his class, or to deliver himself of eccentric opinions in the belief that such opinions are more interesting than knowledge would be, is immemorially contemptible. His students may like him for a while, but in the end they despise him for his condescension to his subject.

The subject is a third thing that transcends both the teacher and the student. It is what the student should contemplate, and it is what the teacher does contemplate. It is the only live thing in the room.

The truly personal teacher is the most responsible to his subject. Because he knows it to be more important than himself, he is humble in its presence and would rather die than misrepresent it. It existed before him, and will exist after him; its life is long, though his is short. But if his life is to mean anything it must mean something in connection with his subject; and it had better mean that he has come to understand it as good persons before him have understood it. Good persons know the same things, just as they resemble one another.

ALL MEN know the same things, or the same thing: the same world. One might think it easy to do this, but it is so difficult that only a few succeed. We call them great men and women.

What, for instance, is a great poet? One who sees what nobody else does? The contrary is surely true. If Shakespeare is the greatest poet, or if Homer is, or Dante—I cannot think of a fourth—the reason is not that he saw what nobody ever saw before; he saw what everyone has

seen, but with a clarity, an intensity, and finally a humility which makes his subject even more interesting to us than he is.

It was more interesting to him than his own self ever was; which is why we know so little about him, and why we know so much about the stories he told, the people he understood. Nor are these people strange to us. They are ourselves with different names. If they were not, we should be less absorbed in them than we are.

Their maker disappears behind them, as we do when we read. They are the folk of this world, and we had not known they were so beautiful or wonderful; nor had we known how much we knew; for what we knew comes home to us now, so that we are proud of the distinction we suddenly discover in ourselves.

Socrates was not joking when he said that the only things we learn are the things we already knew. Only, we did not know we knew them; we did not know our power.

So WHAT shall we say of a teacher who makes his students hate Shakespeare? Impossible though that sounds, the thing has happened.

We shall say first of all that the teacher must have hated Shakespeare too. He only thought he loved him—or worse yet, he pretended that he did. If he really had, there could be no question about the result. His students would love Shakespeare. And the final result would be that Shakespeare was the only thing they remembered. Not their teacher, who gave them the love, but the object of that love.

The good teacher means it when he says he hopes his students will forget him. He never means, of course, that he hopes they will forget his subject. For him that would be tragedy; it would mean that he himself had not existed.

The responsibilities of the teacher are many and yet one. They are to himself, to his subject, to his students, to society, and to the truth.

But the first and last of these come nearest to defining the one in which the many reside.

The teacher whose love of truth is personal, is his own, is the teacher all students dream of encountering some day. And even him they will forget. In time, that is to say, they will. Not in eternity, where truth is one unchanging thing and one unchanging Person.

The Grasshoppers Must Be Caught

"Learning is an active process, never a passive one. Where a student does not react he does not learn. He doesn't soak up 'knowledge' like a flower pot soaks up water. 'Facts,' 'ideas,' and 'applications' can be much more accurately likened to grasshoppers. The instructor can bring them into the classroom and turn them loose. He can turn them loose until the room is filled with them, until he is exhausted, and until the students are awed by the multitude of grasshoppers. But the students cannot use those grasshoppers (for fish bait, or whatever else a grasshopper might be used for) without catching them. The instructor can turn them loose. He can tell the students how to catch them, how to use them when caught, and correct them when they misuse a 'hopper. But those grasshoppers will never do the students any good until they catch them, and they will never learn to use (or even mis-use) the grasshoppers without catching them."

—From an Air Force training pamphlet.

The New Look

Readers of this journal are acquainted with Dr. Tead's interpretations of college and university teaching. A nationally known author in the fields of economics and management, he is author also of notable books on higher education, including the excellent "College Teaching and College Learning" which has now been republished. He is vice president of Harper & Brothers, member of the Board of Higher Education, New York City, and now chairman of the Board of Trustees of Briarcliff College. In this last capacity he was convocation speaker last September at Briarcliff. We are privileged to present his address with minor changes.

By ORDWAY TEAD

I WANT to talk about the new look in college. This has two angles: the angle of your looking at the college and the angle of the college looking at you.

The questions are: What will you find that is new and different here? Will you see yourself clearly in this new setting and rise to the occasion?

Though this address is not directed solely to you, I speak more especially to you new students, because this is in a sense your convocation.

Every beginning becomes a new look, which was recognized by the Bible writer who said: "I saw a new heaven and a new earth; and the former things are passed away."

Of what new things shall we speak? I start with a word on the different look a college has from that of secondary school. I may thus be able to help your self-assurance and build your anticipations.

I shall then consider these questions: In what ways is college educationally a new experience? What does this college ask of you? What should you expect of this college? And finally I hope each of you will ask: Do I realize that I am on an exciting voyage of discovery into the deeper resources of my own self which may well give new direction to my entire life?

THE MOST striking difference from secondary school is that a college places virtually all the responsibility for student survival and for growth *in your own hands.* In spite of what may seem the numerous regulations of the Handbook, your life now has a degree of independence you have not known before.

The responsibility is mainly on *you* in the following matters: you have to decide what to do with 168 hours a week. If you deduct time for eating and sleeping, for class attendance and study, you will still have around 50 hours a week to account for.

Next, you decide what you think. What beliefs, attitudes, opinions will you hold? Some of these may be brought into question by the different views of other students, and by the ideas of faculty members who will advance a variety of outlooks. To be independent in forming your ideas places a new responsibility upon you as to what you think and why, and what you do about it.

You also have a new independence as to your personal associations, and it will be important to cherish as friends those who reenforce your strengths and encourage your best aspirations.

Finally, in your life away from the campus, especially on vacations, you will find that parents are expecting a new sense of independent responsibility from you including your reaching some decision as to what you will do after you graduate.

In short, college is different in marking a clear break toward your being an adult increasingly able to handle the choices that can make life rewarding or bewildering. What you do with life from now on is increasingly *up to you!*

MORE CLOSELY related to the educational process itself are other differences it is well to identify. And you can work to your own advantage as you become conscious of how the college is trying to help you understand its new look. Let me state several characteristics of education at the college level which you will find it worthwhile to understand as soon as possible:

- **The college looks at learning in a special way.**
- **It strives to have you build wholesome self-motivation.**
- **It uses all knowledge to increase self-knowledge.**
- **It makes you conscious of how to think rationally.**

▶ **It offers for your appreciative acceptance the great ideas and the noblest aspirations of mankind, historically viewed.**

I shall not here expand on all these differences. They may well supply topics for later chapel talks. But a few clarifying words are necessary.

THE NEW LOOK at learning means the effort to get the study and learning activities congenial and happy for you. To this end the college tries to start your studies with your present state of knowledge, appealing to your sense of need, interests, and curiosity. To arouse interest in what is studied, to show its meaning *for you,* to make clear its connection with other fields of knowledge, to help assimiliation of ideas into operating usefulness *for you*—all this the college strives to do.

Also, your use of learning can be for a variety of necessary ends. We learn, among other reasons, in order to enrich our background, to supply perspective on events, to increase a skill, to satisfy curiosity, to get knowledge as the basis for judgments of choice and appreciation, to improve habits of clear thinking including attitudes of open-minded approach to ideas and to people. Your success in learning is not registered in marks; it is evident as you come to *think, feel, act, and express* suitably and helpfully in surmounting the difficulties you encounter in fields of study and of all day-to-day activity.

Good colleges are not "student-centered" in any introspective, individualistic sense. They are *learning*-centered and *growth*-centered for all associated with the institution—teachers no less than students.

BUILDING up the right kinds of *self-motivation* is important in this learning process. I refer to employing the internal self-drive to keep one at some learning job with confidence and zest until it is mastered. The college tries to make the fact of learning, the matter to be learned, the outcomes of learning, the summons to your best learning effort—all these so satisfying and rewarding that you inevitably build up the driving motive within you to want to learn. And this generates its own continuing power. Experience shows that awareness of the value of learning and the desire for learning grow in the individual as its results are felt to be worthwhile for better living.

People differ in their native hunger after intellectual and esthetic nourishment. And colleges exist not only to appease what hunger one has, but by presenting an array of attractive dishes to arouse a permanent and varied appetite, so that we may taste and see that the life of the mind is *good* and has satisfactions which age cannot wither nor custom change.

Those, both students and faculty, who say, in contrast to this, that students work primarily for marks, and that their self-motivation is actually the drive to get good grades, to pass courses and get a degree, they are describing the facts about some students. The *desirable* and *happy* efforts, however, go beyond marks to mastery; and every student should discover that the real fun is in the performance, not in the pass mark.

THE THIRD element, that of the use of knowledge to deepen self-knowledge, focuses concern on the importance of a new look at the student's own self, and at the goal of self-discovery, self-fulfillment, or self-realization.

To know ourselves better requires not only that we look honestly within, but that we look outside ourselves in a systematic and searching way to see our relation to nature, to geography, to culture, to economic and social institutions—all having to be learned about if they are to be consciously used as instruments of our enlargement of mind and spirit. Such learning yields that enrichment which produces creative personalities and is the best of correctives to the current criticism that young people today put too much stress on passive conformity. I do not imply that conformity and ignorance are the same, but rather that a widened intellectual horizon invites to more adventuresome living.

THE FOURTH element, that of aiming to cultivate the essential ability to handle rationally and logically all problems that require thinking or reasoning, is basic to the college purpose. Indeed, so in need of emphasis is it, that I propose to devote another whole talk to it later in the year.

A final distintive aspect of this new look is concern for our *at-homeness in the realm of the spirit.* I refer to the purpose of improving our learning of personal sensitivity to beauty, of responsivness to greatness of soul in great personalities, of how to cherish one's creativity as a unique gift, of our becoming aware of ineffable feelings and experiences of mystic union. College would build into our characters drives to conduct that give personal satisfaction in sharing in the joy of these values.

Some say that the sole concern of the college is with the life of the mind and of reason. They

reiterate that knowledge is power and they assume that knowledge inevitably yields the motive power to do the right which one knows—that, in short, to know the good is to do the good.

All this I regard as a dangerous half-truth, the other needful half being that commitment to *do* the good requires, beyond knowledge of right methods, *the drive of right feeling for right ends.* And this feeling can have its source in the example of those we love and admire, from our desire to be approved, from some reiterated suggestion or "conditioning," from one's minding the dictates of conscience as the voice of duty, or from an overwhelming experience felt to be that of divine presence and mandate.

I have up to now been answering questions as to the ways in which college becomes a new body of experience both personally and educationally. These ways cut deep because they have to do with why we learn, how we learn, and what we learn. Learning of one kind or another becomes central; actually it will occur for you in many settings *beyond* the classroom. And the eager cultivation of learning power is thus what the college hopes you will discover as the condition of your own maturing.

WHAT, NOW, does college ask of you? It asks you to realize that *you* must do the learning and that only as you come to *want* to learn is the whole process truly effective. It asks you to desire to discover your self in all its characteristics including a capacity to think clearly, to have an outreach of curiosity as to the world about you, and to feel deeply and warmly toward the lovely and toward those you love. It further asks that you *raise high your sights* about the meaning and worthfulness of your own life, and eagerly realize that you are placed on earth to fulfill a purpose, to obey a body of natural laws which includes expressing by friendly acts a wise affection for your fellow-men in a world society.

College asks you, quite simply, to rise to your own *finest desire for yourself,* and *to be loyal to it in pursuing your self-education.* It does not ask you to be an egghead—only to use your head to become a rounded personality.

NEXT, what should you expect of college? The ideal answer might be that you expect it to surround you with a total situation which supports the college objectives and enlists your support of them as well. This would include the right living conditions, friends, leisure activities, quiet for study, approval by your peers of your intellectual striving, a stimulating faculty, and new ideas about life and work which stretch the mind to new and absorbing dimensions.

You certainly should expect college, in respect to all the unique features a college possesses, to make these features become productive for you. Students are coming to college today for a variety of reasons, some better than others. And I have been pointing out some of the better reasons in the hope that you will rise to their acceptance. For you can hardly expect too much.

A college, we cannot say too often, is a wonderful kind of institution. There is no other just like it. Its purpose in society is noble, and of growing importance and need. It holds in trust for wide dissemination, by persuasion and the attractive appeal of truth and beauty, the *accumulated wisdom and vision of mankind,* upon which foundations we are each to add our contribution, however modest. It is the powerhouse of the mind as the churches are designed to be the powerhouse of the holy spirit of goodwill.

THAT BRINGS ME, finally, to some reference to the relationship which can prevail for the student between his rendezvous with learning and his commitment to religion.

Man does not live by learning alone, and the life of the mind, vital as it is, is not all of life. There is the reality of the *life of the spirit,* and it has its own laws, its own satisfactions, and its own pathway of self-discipline. All of these are in some measure possible of being approached through study, although ultimately each person has to have his own experience of the call of the Spirit to know the presence of the Spirit. I am not saying that the approach to the Spirit is in any way dependent on education. But it still is eternally true that the implementing of the promptings of the Spirit challenges our present capabilities and insights.

What we call the humanities are the college studies which can thus intensify our examination of the universal history of the unfolding and upreaching human spirit. They, perhaps, most of all that is studied, offer us the indispensable vision of human greatness and of the dictates of the Spirit. Included here is the study of all the arts and literatures, of philosophy, of history, and of religion.

The study of religion is by no means the same thing as being religious. But one can remain a stranger to religious experience if its nature and

fruits have never become known about. To be a stranger here is surely to have one's self impoverished and to have had one's journey of self-discovery "bound in shallows and in flats." *Depth* in the self and *elevation* of the self to heights unusual or heretofore unknown (also called self-transcendence)—these are two facets of the same reality. Spirit answers unto spirit; deep calleth unto deep; we are still, and lo, there is the still small voice. We apprehend that by which we are apprehended. We are overpowered with the sense of a Power not ourselves.

"Religion," says a contemporary thinker, "is the affirmation of the anchorage in reality of ideal ends."[1] That affirmation is given light and guidance *by education.* For the nature of reality is a problem studied in education. Ideal ends, or the loftiest goals man can imagine, are pondered in education. This means that the religious search for the will of God depends ultimately not only upon our listening to the still, small voice, but increasingly upon the use of more and better knowledge as disseminated through education.

A still more comprehensive view of religion is further helpful. Whitehead, probably the greatest of recent philosophers, offers this:

> Religion is the vision of something which stands beyond, behind and within, the passing flux of immediate things; something which is real, and yet waiting to be realized; something which is a remote possibility, and yet the greatest of present facts; something that gives meaning to all that passes, and yet eludes apprehension; something whose possession is the final good, and yet is beyond all reach; something which is the ultimate ideal, and the hopeless quest.[2]

There is a setting forth with true profundity of the paradoxical, tantalizing, universal qualities that make up deep religious feelings. That these are desirable, important, meaningful, revealing, and valid feelings will seem evident to most. We recognize ourselves in the tensions of belief Whitehead describes. Here are emotions to be understood, disclosures which are foundational for a life of creativity and transcendence. The philosopher says in one idiom what St. Augustine said to somewhat the same effect in another way. For his was the classic utterance: "Thou hast made us for Thyself; and our hearts are restless till they find their rest in Thee!"

Here is a kind of experience which is shared among loyal adherents of many faiths. An intermingling of purpose, meaning, dignity, and holiness in one's day-to-day living with dedicated, Godly living—such is the shared spiritual knowledge of all deeply religious souls. And as this grasp of the interrelation of action and faith becomes more generally understood, the role of higher education gains in its indispensable value because it can help us to give wise direction to action.

For it is through our education that we search out the knowledge of those laws of physical nature and human nature which disclose their becoming toward the divine nature.

Put more concretely, the elevation of spirit one gets from attending church, synagogue, cathedral, or mosque, has to be guided into concrete expression by the elevation of mind to be achieved from the classroom. The moral claims of religion gain their practical focus toward ethical conduct from the rational claims which are the gift of education.

THE NEW LOOK in college, which we are this afternoon testifying to, is as comprehensive as life itself. College and life are at once identical and different. It is the differences I have stressed. This I have done in order to emphasize the new goals and methods we are in college to master. Self-discovery, growth in excellence and maturity, integrity of character, assurance of the priceless worth both of life and of learning in order to help improve living, confidence in the pursuit of Godlike values, commitment to the holy, reverence for life's sanctity—it is for the furtherance of *these* that we are here.

We are at college for a new look at life's best hopes. Religion comes to us that we may have life and have it more abundantly; this is the great truth which education can direct us to and document. Education and religion have as a common purpose this enrichment of living. That is why it is truly prophetic to repeat, as we start a college year: "I saw a new heaven and a new earth; and the former things are passed away."

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[1] See "The Coming World Civilization" by W. E. Hocking, Harper & Brothers, 1957, p. 30.

[2] See "Science and the Modern World," by A. N. Whitehead, Macmillan, 1925, p. 275.

Conant's Administrative Discovery of Teaching

A new and convincing aspect of the distinguished career of James Bryant Conant is his "administrative discovery of teaching" reported by a man who was himself ten years a university President but returned to teaching as professor and director of the Center for Practical Politics, Rollins College. Dr. Douglass has contributed to earlier issues of this journal.

By PAUL DOUGLASS

THE TWENTY YEARS of experience of James B. Conant as president of Harvard University (1933-1953) provide a vivid case study of an administrative discovery of teaching.

By academic history, personal interest, and professional performance James B. Conant in the beginning literally "belonged" to the chemistry department of Harvard University in the possessive denotation of the verb. When he walked into Harvard Yard from Roxbury Latin School in the fall of 1910, he thought of himself more as a chemist than as a Crimson freshman. Promptly he presented himself in his first year for voluntary examination in general chemistry, solid geometry, logarithms, and plane and spherical trigonometry. Thus he cleared the way for his advanced study of chemistry. At the end of his third year he completed his undergraduate studies, was elected to Phi Beta Kappa, took his baccaulaureate degree, and was named an honorary John Harvard Fellow. Without stopping for his master's degree, he began to teach. In 1916 he took his Ph.D.

Following a two-and-a-half year tour of duty in World War I to lead a task force in the manufacture of Lewisite gas, Conant in 1919 returned to Cambridge as a major. Harvard gave him the rank of assistant professor. In 1921 he married Grace Richards, the daughter of the chairman of the department of chemistry. For the next dozen years he lived the strenuous life of an active professor. He wrote text books. He edited treatises. Between 1926 and 1933 he published over eighty papers in scientific journals. He became technical adviser and consultant to corporations. In 1929 he was elected to the Sheldon Emery Chair of Organic Chemistry. At the age of thirty-eight he became chairman of the department. In the single year of 1932 Conant received both the Charles F. Chandler Medal at Columbia University and the William H. Nichols Medal of the American Chemical Society. In professional circles colleagues talked of him as a scientist worthy of a Nobel prize. For the twenty-three years during which he had been at Harvard since his freshman days in 1910, Conant's life had centered around the laboratory—and in particular, Converse Laboratory.

HARVARD PRESIDENT

Conant's career as a professor of chemistry was interrupted in the spring of 1933 by his election to succeed A. Lawrence Lowell as the twenty-third president of Harvard University. Harvard had the venerable distinction of being the first collegiate foundation to be established in the Anglo-Saxon settlement in North America and the most generously endowed independent university in the

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world. The election came as much as a surprise to the chemist in Converse Hall as it did to the Harvard faculty.

In the fall Conant abdicated his cloistered stool by the lab table. Henceforth, as he said, he was compelled "to shut off chemistry into a small and little-used corner" of his mind. Administrative pressures terminated his scientific explorations. "Since the day I succeeded Lowell," he said, "I can't claim to have advanced the frontiers of science one millimeter."

With Puritan simplicity James B. Conant was installed as president of Harvard University in a fifteen-minute ceremony. According to tradition the Harvard choir sang the thirty-eighth psalm: "So he led them according to the integrity of his heart; and guided them by the skill of his hands." From President Lowell Conant inherited an educational program which stood on three foundation stones: (1) the tutorial, (2) the general examination, and (3) the residence house plan. For two decades as president of Harvard Conant struggled to infuse into this magnificent structure a contagious intellectual enthusiasm which would justify the whole lavish apparatus which Cambridge provided. For twenty eventful years Conant explored the Harvard educational performance with the same imaginative scientific patience which he demonstrated in former years in his researches into the mysteries of chlorophyll and hemoglobin in Converse Lab.

To help him understand his job, he plunged systematically into a reading of educational history. As he became familiar with Harvard's past, he saw as his major problem the identical issue which had challenged Lowell and Eliot before him: *the improvement of teaching.*

Eliot's Elective Program and Lowell's Reform

Eliot, as Conant read the record, had approached the improvement of teaching by proposing the elective system. To Eliot it seemed axiomatic that a college must attend to the individual characteristics of many different minds. A boy of eighteen or nineteen, so he thought, should study what he best likes and what he is best fitted to undertake. The college should provide a curriculum which gives free play to natural preferences and inborn aptitudes. Indeed Eliot looked upon the free elective as a historic development in the general pattern of human freedom.

Conant studied Lowell's reaction to the elective system and his program for reforming it. Lowell's studies of student folkways under Eliot's program revealed that many Harvard men were piddling in too many different fields or were specializing excessively in one narrow field. Students were choosing subjects haphazardly. Their choices were determined too largely by the convenience of the hour of class sessions. Students were "guiding" fellow students into notoriously easy courses classified as "snaps." Some students, like Conant himself, were rushing through the college in a three-year sprint. Early in his presidency, Lowell had attempted to stiffen up "snap" courses, to "beef up" honors work, and to encourage students to specialize more thoroughly in one major field while at the same time broadening the educational base for taking work in several fields.

In 1910, the year in which Conant entered Harvard as a freshman, the College put into effect a plan of concentrated and distributed studies which reoriented the whole fabric of American undergraduate education. Lowell wanted students to plan their courses carefully and as a whole. To encourage breadth Lowell recommended distribution; to provide for depth he proposed concentration. In 1912 Lowell added the tutorial plan. This tutorial arrangement provided a highly individual and expensive form of instruction, but in theory it established an intellectual partnership so that each student had the opportunity and incentive to develop his fullest powers. Four years after the introduction of the tutorial plan, Harvard in 1916 added a general examination. Conant liked the idea because it provided a means for testing a student's grasp of his major field by something more than bookkeeping calculations of course credits.

Both as an undergraduate and as a graduate student Conant had experienced the Harvard program as Eliot bequeathed it to Lowell. Now from the administrator's chair he saw what Lowell had bequeathed to him. Lowell's grand pattern, it needed to be admitted, had not been an unqualified success. It superimposed an expensive tutorial system upon an elaborate program of courses. Few faculty members of professorial rank were willing to give more than a small fraction of their time to tutorial instruction. Private commercial tutoring schools flourished. In fact the *Harvard Crimson* coined the slogan: "Instruction by Wolfe; diploma by Harvard," as descriptive of the educational situation in Cambridge.

As Conant surveyed Harvard as an educational

whole, he took satisfaction in its selected students, its matchless faculty, and its magnificent equipment. "Something" however seemed lacking. He began a search for that "personal something" as he called it, which no external apparatus, however lush, could provide. The nature of that "something" somehow seemed to elude him; but he was convinced that when found it would constitute the essential element of an education. Thus as a young university president Conant began a lonely pilgrimage in a *search for a deep, personal inner motivation which would make a man want to learn in Harvard College and continue to learn throughout life.* He described the idea toward which he was groping as the discovery of ways and means to "infect students with the *virus of on-going intellectual activity.*" He put it like this:

> A liberal education which is not self-perpetuating is of no enduring value. The only worthwhile liberal education is one which is a continuing process going on throughout life. Whether a liberal education has been a success or failure should be measured by the student's breadth of vision twenty years after graduation. Has the smattering gained in college work grown thinner with each succeeding year? If so, it has been of little value. Or has it provided a basis for continued intellectual and spiritual growth? In this case the momentum to self-education continues as the most signficant part of college training.

It bothered Conant to see that despite all the effort and educational opportunity provided by Harvard, the men, in their own vernacular, were still "taking courses" rather than "studying subjects." How could Harvard better infect its men with the contagious virus of on-going intellectual activity? The search for the answer to this question became Conant's compelling educational mission.

To widen his perspective on the issue, Conant extended his reading to include English educational history. He put it down in his book from the experience of the British civil service that it is absurd to "hold out premiums of knowledge of wide surface and small depth."

Incentives to Self-Education

Conant began a one-man campaign to provide "incentives to self-education." "Would it not be possible," he asked, "to experiment with methods of inoculating Harvard students with that educational virus which alone maintains its potency throughout life—the virus of a self-perpetuating liberal education?" Would it not be possible to inculcate in a large number of Harvard men the habit of reading and intensive study apart from courses and entirely outside the field of major interest? Conant identified a number of Harvard men who already were finding the time necessary for this type of activity. These men budgeted their time during the college term so that they could pursue work for which they received no formal credit. They ordered their vacations so that their study suffered no interruption. After graduation, Conant said, such men carried with them not only the knowledge thus acquired but the key to ongoing education. "How can their number be increased?" This was the educational question which Conant asked when he became president of Harvard; it was the question which he still was asking when he retired as president emeritus twenty years later. Conant had failed to find and put to work the magic educational formula. He commented without disillusionment:

> Undoubtedly there are still many people who believe that education would work miracles if only the perfect pattern could be found and the proper persons engaged to execute the design of a philosophy of education. But even the most optimistic believer in the power of formal education to transform thistles into figs would recognize that gathering the fruit from the usual source would be more economical.

Side by side with his concern for injecting the "virus" of an "ongoing education" into the intellectual veins of Harvard men, Conant put his finger on another issue which he believed to lie at the root of all current academic controversies. Conant stated the root problem like this: "How can a student acquire a breadth of view, so much admired and desired as an ideal, and yet which one so rarely finds in this age of specialists?"

American History Case

Conant began to glimpse the possibility of a core study *independently and individually pursued* which would deal with the historical, political, social, and cultural development of the United States. The more Conant thought about the idea, the more he was strengthened in his conclusion that such extracurricular study might serve as an *integrating* discipline. Although pressures of academic life during World War II buried the program in the graveyard of ambitious projects, its central idea gave shape to Conant's own thinking. He said:

> It seems to me possible to find the principle that is needed to unify our liberal arts tradition and to mold it to suit the modern age. A true appreciation of this country's past might be the common denominator of any educated man's equipment so that men can face the future united and unafraid. Such a possibility does not narrow the breadth of vision in either time

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> or space. On the contrary, starting with a keen interest in his own past, a student is necessarily drawn into an ever widening field. He would master the decisive and characteristic views that have welded our present civilization in the United States . . . Any attempt to rescue the liberal arts tradition from its present dilemma must be extremely tentative. Almost any reasonable approach to the problem seems worthy of trial. It is in this spirit that the efforts of those interested in the extracurricular study of American history must be viewed.

Harvard's Tercentenary

Presently Conant found himself caught up in the thinking, planning, and arranging for the Harvard tercentenary celebration. Conant, the chemist, was compelled as Conant, the president, to give detailed consideration to the glorious tradition of Harvard and the problems of its students within the much longer historical setting of universities as a movement in the Western world. His conversation, speeches, and writings began to reflect his broadened horizons and his deepening understanding for the roots and processes of teaching.

In the development of the tercentenary program, Conant discovered that the "specialties" on a campus are "old friends joined by historical intellectual ties." Conant began to see the role of the university on the one hand as that of increasing specialization. At the same time he believed an increasing unity was evolving through knowledge of the ancestry and relationship of ideas. He began to feel that much of the "academic fencing" between departments could be avoided by an appeal to a "common family tradition." The classicist, he said as he took the longer look into educational history, can proudly claim as his ancestor such sixteenth century giants as Scaliger and Casaubon; but so can the physicist and biologist.

University Defined

From his studies in university histories Conant formulated a working definition which gave further direction to his explorations. *"A university,"* he said, *"is an independent, self-governing community of scholars concerned with professional education, the advancement of knowledge, and the general education of the leading citizens."* He was convinced that universities flourish when four elements stand properly in balance, namely: (1) the cultivation of learning for its own sake, (2) an educational current that supports specialization, making possible the professions, (3) a core of general education sustaining the liberal arts, and (4) a never-failing zest of student life carrying all the power that comes from the gregarious impulses of human beings. Inherent in each of these four components, Conant saw certain tugs toward imbalance. The cultivation of learning alone produces not a university but a research institution. Professional education, if left to itself, results in nothing but a trade school. Concern with general education alone, even in the best liberal arts tradition, when divorced from research and training for the professions, admittedly exists not as a university but as a college. Student life, of its own genius, tends to make the campus a country club. The task of a university administrator must always be to keep a balance among these four traditional elements of strength, undergirded by (1) financial solvency, (2) a student body of high quality, and (3) an outstanding faculty.

The Community of Scholars

From his administrative duties in connection with the tercentenary, Conant emerged, not alone with a broadened historical understanding of the roots and processes of higher education; he began to look with increasing reverence upon the university as a community of scholars. To him the campus became hallowed ground. He said:

> Universities are now the residuary legatees of many of the spiritual values which were guarded by the church three centuries ago. Our responsibilities are correspondingly increased and our ideals must be clearly defined. If future generations are to have that high regard for the achievements of the human mind which is essential to civilization, there must be a true reverence for learning in the community. A university's first job is the guardianship of eternal values.

Since universities in Conant's mind "are trustees into whose hands the fate of human knowledge is committed," the man who enters a university walks on dedicated ground where the ideals of 'free discussion, unmolested inquiry, and reverence for the American tradition of dissent prevail." Conant committed to heart the statement which President Charles W. Eliot uttered in his inaugural address in 1869 to the effect that *"the only conceivable aim of a college government in our day is to broaden, deepen, and invigorate American teaching in all branches of learning."*

As Harvard moved on in the late 30's from the tercentenary to the celebration of the centenary of Horace Mann in 1937, Conant began to ask himself even more fundamental questions. Who should teach? What should teachers teach?

Whom should they teach? Who should authorize teachers to teach? Under what conditions, standards, and control should they serve? What values, ends, and social goals should concern them? What picture of economic life should teachers present to youth? Soon Conant was head-over-heels involved in Harvard's new program for the master of arts in teaching and quite as much in activity dealing with educational policy in secondary schools. Through the master's program he felt that Harvard was establishing a contact between the university and the educational life of the community which the secondary school makes its province. He took pride that Harvard was doing its part in lifting the vocation of teaching from the level of a "job" to recognition as one of the most important social functions, requiring the clearest thinking about the goals of common life.

Controversy and Dissent

Presently Harvard was confronted with issues arising from the enactment of the teacher's oath by the General Court of the Commonwealth of Massachusetts. He took a firm position, and this position added to his maturing concept of the role of the teacher. He asserted that the integrity of tenure in the office of full professor must be held sacred, together with the right of the teacher to free speech. Then, he said, professors in turn may be relied upon to form a responsible opinion within each academic community. He urged his faculty to "speak freely as private citizens on public issues."

Conant's practical position had theoretical and historic roots. Harvard itself, he told the students in Memorial Chapel, was founded by vigorous dissenters. He asserted that any barrier to the expression of an opinion opposed to a commonly held doctrine froze society into a status quo which threatened life with stagnation. He said:

> If a university is to be alive for generation after generation, the institution in question must be in close touch with the life of the community which it serves. The essential motivating force behind a university's scholarly work and research in all times and places when universities have flourished has been the connection between the scholar's activities and the burning questions of the day. If this be the case, there is bound to be public discussion of what some scholars may write or say. The world cannot have it both ways: either the professors live in ivory towers and their teaching and thinking have no relevance to the times in which they live or the professors are going to have views that somebody will not like. Sometimes one part of a university, sometimes another is criticized. The idea that a university is some kind of ivory tower seems to be a pure myth that has grown up in recent times . . . It will be a sad day for the United States if the tradition of dissent is driven out of the university. For it is freedom to disagree, to quarrel with authority on intellectual matters, to think otherwise, that has made this nation what it is today. Indeed I would go farther, and say that our industrial society was pioneered by men who were dissenters, who challenged orthodoxy in some fields, and challenged it successfully. The global struggle with Communism turns on this very point.

Teaching and Research

To Conant, research chemist become administrator, it became increasingly clear that on the Harvard faculty there should never be a separation of personnel into those who teach and those who carry on creative research work. Looking again at Harvard history, he asserted that Harvard's strength in the past had lain in the fact that the spirit of scholarship had pervaded teaching and that teaching had led to the advancement of knowledge in specialized fields. Conant was clear:

> Only by advancing learning is it possible to perpetuate it. When knowledge ceases to expand and develop, it becomes devitalized, degraded, and a matter of little importance to the present or the future. The community loses interest and the youth of the country responds to other challenges. Able young men enlist in an enterprise only if they are persuaded that they too may contribute by creative work. A zest for intellectual adventure should be the characteristic of every university. In the future as in the past, our teachers must be scholars who are extending the frontiers of knowledge in every direction.

Recognizing that research and teaching were part and parcel of the same intellectual activity, Conant as an administrator was faced with the problem of commitments of professors to obligations off the campus. He understood the problem because he himself as a professor of chemistry had been heavily involved and richly rewarded. He stated his position like this:

> No reasonable person objects to the undertaking of work for the city, state, or nation by a social scientist or to a chemist's serving as advisor to the chemical industry. *No retirement to a lonely hilltop is desired.* But the whole life of a scholar must be dominated by his desire to further a branch of learning—and here lies the great responsibility for all those who are teachers in a university. The university cannot and should not impose any limitations upon outside activities as such. The question is whether, over a period of years, this work is incidental to a man's teaching and research or vice versa. Where is his primary field of interest?

Between the university and the heavily industrial society in which modern man lives, Conant saw an increasing teamwork, since leaders must more and more look to the campus for specialists to advise and help with basic and applied technical and social problems and for a steady supply of capable, imaginative, and forward-looking professional workers.

Uni-versity versus Multi-versity

Conant held the ideal that Harvard should be a "uni-versity" rather than a "multi-versity." He said:

> The administration of a great university must endeavor to find methods of counteracting the centrifugal forces which tend to separate faculties into an ever-increasing number of subdivisions.

To advance the "uni-versity" principle, he used various means. He appointed advisory research committees. He worked for the establishment of a few university professors with roving commissions—professors without portfolio, brilliant and imaginative men whose task it was to synthesize modern knowledge. He proposed the appointment of professors for the special study of the history of university education as a means of emphasizing the unity that lies at the heart of the diversity of specialists incorporated in a university faculty. He developed the plan of visiting committees to join the academic community to the current world.

General Education in a Free Society

In June 1940 President Roosevelt appointed Conant as a chemical member of the National Defense Research Committee headed by Vannevar Bush. From the moment of his appointment Conant stepped behind a political veil. For the next five years he discharged his duties under conditions of high secrecy. For half a decade he was a part of every top policy, scientific, political, and military group dealing with pure and applied science. The burden of his assignment however did not dampen his concern for teaching.

In 1943, ten years after his election to the presidency of Harvard University, Conant appointed a university *Committee on the Objectives of a General Education in a Free Society*. For two years the Committee tapped the experience of American education, sought the advice of specialists from all over the world, and finally made an educational proposal, the purpose of which was "to cultivate in the largest possible number of our future citizens an appreciation of both the responsibilities and the benefits which come to them because they are Americans and because they are free."

While the report promptly influenced American higher education, it pointed out that at Harvard general education had been "neglected." It found no one course required of all undergraduates. On the other hand it found the concentration areas supported by an impressive battery of educational machinery: teaching departments, prescribed courses, systems of honors, tutorials, and general examinations. In the area of general education, however, the committee reported that general education was "dismissed with a vague prescription on its desirability." It found Harvard weak in the opportunities it provided for the development of a common body of information and ideas which would be in some measure the possession of all students.

Without going into detail, it can be pointed out that the area which Lowell had labeled "distribution" became under Conant a general education program. Conant, still concerned with the inoculation of students with the virus of ongoing intellectual activity, said that the real evaluation of the program of general education would have to come in 1975: to see then whether Harvard men had been stimulated to a life of substantial reading, continued intellectual work, and active citizenship. This was the same hope which Conant had held back in 1933 when he first proposed the "extracurricular" course in American history.

Now Conant made the final observation which rounded out his administrative discovery of teaching. He knew that no academic design is stronger than the professors through whom it flows. The *Crimson*, critical of the new adventure in general education at Harvard, pointed out that one reason that the general education program was encountering difficulty, lay in the province of instruction. Conant was all too aware that in the end every educational design stands or falls on its acceptance and implementation by teachers. Therefore President Conant undertook a routine in the classroom with a course scheduled at 9:00 o'clock on Mondays-Wednesdays-Fridays. He put his shoulder to the wheel in syllabus building and in classroom instruction. Back in the classroom for the first time since 1933, Conant demonstrated the same flair for dramatic presentation which had characterized his performance in the earlier days when he used to dip a raw egg in a fluid, hurl

it over the heads of the horrified students, and bounce the solidified albumen on the far wall. To provide case studies necessary for instruction in his course on "The Growth of the Experimental Sciences" Conant proceeded to edit the *Harvard Case Histories in Experimental Science.* With the enthusiasm characteristic of a young instructor, President Conant taught with a purpose: to equip Harvard men, who were to become lawyers, teachers, writers, public officials, business men—citizens all—with "a feel for the tactics and strategy of science."

The Unending Educational Goal: Improvement of Teaching

The Conant era in Harvard's continuing quest for effective education fell into perspective in Harvard history as still another attempt of another faculty generation to work out the fundamentals of a liberal education. In part it expressed alarm, which was in Conant's very being, over the outcome of the world crisis. The program sounded a call to academic arms to preserve the heritage of the Western world. In part it was an attempt to meet conditions created by the revolution going on in a highly industrialized scientific society. Further, it was recognition that with all its enormous resources Harvard University had not satisfactorily succeeded in "infecting" students with the educational "virus." Conant's era was another of the perennially optimistic attempts of a faculty to nudge students off dead-center, to bump them from their intellectual inertia and complacency.

Conant's Personal Achievement

Behind the new program, however, lay the personal pilgrimage of James B. Conant whose heart remained in the classroom. He began to define education as what is left after all that has been learned has been forgotten. Beyond and beneath the famed report, Conant continued to think of general education as a method of continuing learning pursued through the intensive study of certain topics or phases of a problem. In life he wanted that educational method to carry over and carry on as a habit.

Whatever else may have happened during the twenty years of Conant's efforts to improve teaching in Cambridge, it became clear that Eliot, Lowell, and Conant, all three, had been searching for the same "virus" over different decades in different ways, and in the face of different problems. *Conant found the answer of momentum to self-education and the virus of on-going intellectual activity within himself. His administration of Harvard University had given to him the kind of Harvard education which he wished to share with others and to offer to new generations of students.*

On becoming emeritus president of Harvard, Conant described his vision of the role of the university in a short valedictory. He said:

> The universities of this nation will be even more significant in 1975 than they are today. As vital centers of sound learning, as strong points defending individual liberty, as communities of creative thinkers, no industrialized democracy can do without them; each year will demonstrate their indispensability to the society of free men . . . The goal which we desire is a unified, coherent culture suitable for an American democracy in this new age of the machine and experts.

Thinking Decides Action

"As for thinking interfering with action, that is using one word in two senses. It is not Thinking that interferes with action: Thinking decides action. It is hesitation in thought that interferes with action; it is paralysis in Thought that interferes with action, like the weariness of the mind wherein a tune goes on buzzing in one's head."

Hilaire Belloc
A Conversation With a Cat
New York: Harper & Brothers. 1931. Page 139.

When Students Play on the Team

Readers who read Dr. Hatch's article on "The Lecture" in the preceding issue of this journal are advised now to read the following commentary by the author himself. In so doing it will be well to review or reread the original article as the commentary will interpret and enrich the meaning of the article. The key to the whole series is found in "Inquiry into Inquiry" in the Autumn 1957 issue.

By **WINSLOW R. HATCH**

IN THE TYPE of lecture described in the last issue of this journal, students come prepared not to listen but to *participate*. And they do "prepare" for the lecture because unprepared they waste their time, miss the fun, and jeopardize their chances of passing the course. Moreover, the students can prepare themselves for the lecture without a lot of lost motion. First, they have a "wave length" to tune in on because the topic of the lecture has been identified to them in advance. Second, in their reading they have to think as well as memorize. To come to the lecture without any idea of at least some of the implications in their facts results in their becoming academic "wallflowers." Lacking this kind of preparation, they get lost at the first turn in the argument, miss the point of the story, take too many wrong notes. Finally, it is easy to acquire a minimal number of facts and in short order because the facts pertinent to the subject are placed in the students' hands in the form of edited transcripts of the preceding year's lecture. The facts in these lecture transcripts, however, are usually only identified, not explained. For the detailed explanation of the part or the process, there is the textbook, which usually is more complete than most lectures can be. If one wants to push his personal inquiry further, a reference library and a reference librarian are nearer the students than their dormitory mates or fraternity brothers and are sources of information far more dependable.

The kind of "lecture" that was described and concretely illustrated in the edited transcript sacrifices few if any of the demonstrable advantages of the conventional lecture. For example, one does not have to forego the "showmanship." In the kind of lecture described showmanship is used to dramatize the excitement of inquiry. It is employed, however, not to entertain students but to involve them. Always desirable, it is essential in the kind of teaching described here to give all the students the same compass bearings, particularly since the class group is large and has to be sectioned. The "lecture" is used as a "huddle" in which the "signals" are agreed upon for the sequence of plays to follow: the laboratories, the conferences, and the subsequent lectures. This is also the place where the "Monday morning quarterbacking" is done if some "plays" have not made much yardage the previous week. In the type of "lecture" described, an orderly presentation of material can be contrived, only in this kind of teaching the students are shown how sense is made out of non-sense by organization that goes on in front of them.

Because the teacher involves students in his lecture, he is not excused from being any less complete as to his facts. Actually, when inquiry characterizes his teaching he is forced to look even more closely at the older literature and to be particularly attentive to current research. Inquiry must not fail for the lack of a "horse shoe nail" that might be found in close reading.

Added to the elements of showmanship, of the common presentation, and of the orderly presentation which are parts of a good conventional lecture, there are extras in the "lecture" as we use it. Added to the showmanship is an ingredient essential to all effective showmen, namely, a dynamic rapport with one's audience, an identification of the audience with the showman. Where a definitive statement of the problem is arrived at by students and lecturer, where the problem is analyzed together, where the students volunteer their facts, where the outlines and diagrams are constructed together, audience participation is achieved to a degree that is impossible in the conventional lecture.

In the "lecture" students are led but not dominated. The lecturer thinks out loud, asks questions of himself and of anybody within hearing, chuckles at his own irrelevancies and gloats over some unexpected association or the unexpected source of the association. No student feels obligated to talk (there are obviously too many for his contribution to be mandatory), and few students appear to feel any embarrassment in volunteering an idea or fact or even in taking the

lecturer to task for lapses in his presentation. Finally, in this kind of lecture one talks into the faces of students and not to the tops of bent heads. One can, accordingly, tell when he is registering and, what is more important, when he is not. While it is flattering to have one's students take down every word one drops, it is not a very discriminating form of flattery. It is more flattering and more helpful to find the students looking at you. They tend to watch you closely only when they are prepared and interested in what you are doing. An important consideration here is that the lecturer must assume that his students are prepared and proceed as if they were prepared. If he does their work for them they will not do it.

If such a "lecture" sounds like an accident, we have failed to make it clear that a great deal of preparation is required on the part of the lecturer, more perhaps than for the usual lecture. The lecturer not only must check his facts and the literature but must study his course. He needs to be clear as to just "where we are," and he has to evaluate the performance of his students to determine "where they are."

After the plan of the lecture has been settled upon the lecturer should, however, cut loose from his notes both physically and psychologically. He should be out in front of his class working on their problem. As a matter of fact, he is likely to spend most of his time moving toward a student who has made a suggestion and then back to the blackboard as he attempts to get his and the students' ideas on the board. The lecturer's willingness to depart from his notes must be real and his adaptability and scholarship such that he can take a student's question or suggestion as his point of departure in place of the one he may have had in mind. He has to improvise from this point on, but if he has explored the subject under discussion well enough and has anticipated most of the hypotheses that might be advanced, he can move the discussion toward some significant conclusion, dropping pregnant question marks, facts that have escaped the students, and sources.

That lectures of this sort are assimilable, have a pattern, flow and cohere, is suggested by the experience of a blind, or nearly blind, student who arranged to have a free hour after each lecture. In the corner of a vacant laboratory she would run over, in her mind's eye, what she had just heard. This was enough to fix the lecture in her memory.

Visualization is, of course, an important aid to learning. Where what one is learning is "organized common sense" the meaning of this phrase can be made graphic if, starting with a blank blackboard, the lecturer starts spotting his facts on the board without there apparently being any method in his madness. If at the end of the "lecture" the blackboard is neatly columned, and the facts in these columns numbered in some logical sequence, the phrase takes on real meaning. Sometimes one's facts can be pyramided or strung in a circle or made the legs that support an explanation. While the explanation is not given to the students, it is made easier this way.

It is our observation that most students simply take down "what makes" the blackboard. We capitalize on this by writing on the board the essence of whatever it is that is under discussion. Sometimes it is the lecturer's and sometimes the student's contribution. This encourages student participation because, as they put it, "if you 'make the board' you're playing with the first team." In working at the blackboard the brightest chalk is reserved for question marks, and the blackboard after a good lecture is well decorated with them. The thing advised against is the prepared chart. Ours is a "do-it-yourself" philosophy—do it with the students. If you are no artist it is all the more fun. Since students are not going to attach significance to that which the teacher treats lightly, it is our custom, the first thing in the lecture and in lecture after lecture, to write out on the blackboard the problem we are currently working on.

There is usually a generous overlap of lecture with lecture, of lecture with laboratory or discussion meeting, whichever is most pertinent. The point is to get everyone you can "aboard" before you move off. To do this well, the lecturer must follow the performance of the students in at least one laboratory and conference, and preferably in several. The lecturer is the leader in staff meetings, explaining just what is planned for the lecture, the laboratory, and the conferences, and just how he plans to coordinate the work in the several meetings. It is also desirable to have all of the staff audit the lectures and sometimes the laboratories and conferences taken by the lecturer. He, better than anyone else, sees the picture whole and is able to fit the parts together with the greatest confidence and competence.

The point of it all is that teacher and students are a team, and students really play on the team.

The Laboratory

As Dr. Hatch has interpreted the higher learning as INQUIRY *and given an enriched character to the Lecture, he now shows how the Laboratory, also a form of Inquiry, impels students to think. We believe these vital interpretations of college teaching and college learning will soon be assembled in a book. Meanwhile we regard it a privilege to bring them now to the readers of this journal.*

By **WINSLOW R. HATCH**

IN THE LABORATORY of a course using a method of inquiry[1] the instructor announces the problem and the students are turned loose to observe or test or experiment as the problem requires. There is no manual of instruction. The student looks at or does whatever he thinks—whatever the analysis of the problem tells him—he should look at or do. When the students have completed their "stint," the instructor faces them with questions such as these: "What were you looking for?" "Why did you do what you did?" If more than one response is made (and more are always sought) the class is asked to evaluate the different responses.

"Did you find what you were looking for?" If the answer is "No," the next question, of course, is "Why not?" Was something wrong with the demonstration or did the fault lie in the students' powers of observation? "What, then, is the answer?" or "What are the answers?" There may be as many different answers to these questions as there are students, and usually there are two or more answers about which two or more students have considerable conviction.

"Why do you think you are right?" and "Why do *you* think *you* are right?" "Are you both right?" the instructor asks. If only one is right the next question may be, "What mistake in interpretation did you make?" This mistake is not only pointed out to the class, usually by the class, but the class itself tries to determine why it made such other mistakes as it did.

The last question, usually directed to one of the better students, is, "How did you know you had the correct answer?" "I checked it." The class, sometimes in a chorus, asks, "How?" and keeps on asking until it is satisfied. And so the students teach themselves. In all this the instructor makes himself as inconspicuous as possible, and sometimes with good cause, because now and then the class discovers that he inadvertently withheld an essential fact, or did not establish an essential relationship, or asked his question badly.

The class now turns to another, but similar, problem to make certain that it knows the answer to this *kind* of problem and not just the problem so recently disposed of.

The instructor anticipates the end of the laboratory by raising the question, "But how does this help us to get on with our major problem? 'Does life have a structure?' [or whatever the current problem is]. It is the business of the dialogue to provide these answers." We may spend several weeks closing in on these major problems, but sooner or later the students come up with their answers, and their satisfaction—their evident satisfaction—is their reward and the instructor's as well. The instructor's role, while not so obtrusive as that of some laboratory assistants, is a significant one.

While the students do a lot of the teaching, the turn given to the discussion by the instructor may be very important, more important than the flow of answers into attentive ears. In the latter case everybody is working, but few minds; the students are busily proving to themselves and to the instructor that they can hear what he says, or read his manual. "To what point?" is a question they do not ask.

The problems turned in at the end of each laboratory are graded 1, 2, 3, and 4, and returned at the next laboratory. These problems help the student to discover what he knows and what he does not know, what he can do and what he cannot, how many ideas are his and how many still belong to the teacher; how well he thinks. They also show the instructor how well he teaches. Since all the problems for a semester account for only 48 of a possible 500 points, no one is hurt and all are the gainers for having made weekly self-appraisals. The problems also serve as a good record of the course, because each problem is corrected, each poor sketch replaced with

1 See "The Socratic Method in Modern Dress: A Form of Inquiry", *Improving College and University Teaching*, Summer 1957, page 60. "Inquiry Into Inquiry." Ibid. Autumn 1957, page 93.

a good one, each poor deduction replaced by a sound one. When each laboratory is knotted to the next, a ball of twine is fashioned that enables the students to work backward and forward through the course without getting lost. The hour examinations simply test how well these knots are tied. The final examination is a critical one, in that the student discovers from it whether his knowledge will support him when, in the crises of the next course or of life, he has to use these methods and ideas.

While the materials for the laboratories for any given week are the same, different problems are taken up in the several sections so that each section has to work out its own salvation. The students, sixteen in number, are seated in a semicircle surrounding the materials assembled for the week. This number and this arrangement can be multiplied by whatever factor space permits.

The test of a pie is in the eating. The test of a laboratory lies, of course, in its achievement. Of this the reader is the best judge; since we want his opinion, we are presenting herewith a transcript of the first laboratory.

Laboratory I

Green Plants

This meeting is anticipated in lecture, where the students have determined that before they can answer their problem about the structure of life they must make some kind of survey of living things. The three kingdoms, and a fourth category, organisms of uncertain position, have accordingly been surveyed. The classes of green plants, nongreen plants, and animals have been identified and epitomized in nontechnical language, and an announcement has been made that the first laboratory will be given to the study of green plants. The student has been advised to get his facts straight before he comes to the laboratory and to think about green plants to the point where he can anticipate some of the problems with which he will be faced.

In the lectures we have suggested that one thinks in ways analagous to the way one drives a car; that to throw a study such as this into gear one must develop a sense of problem or *P*; that the next position on the gearshift is *A* or Analysis; the next *O* or Observation. This latter, we tell the students, is the gear they will use most. An explanation of what they observe, however, will require interpretation, and this position on the gear-shift dial is identified as *H* or Hypothesis. Finally, we urge the students to throw their study into overdrive, into *CH* or Check Hypothesis. This is the background they bring to the first laboratory.

The materials are arranged on three benches. Bench 1 is given over to representative flowering plants and the parts thereof: Poinsettia for floral bracts; a rosaceous plant for a complete flower; Begonias, to show unisexual flowers; a liliaceous plant; a composite flower; a grass flower; male and female willow catkins, with individual florets under dissecting miscroscopes; sweet pea flowers, pea pods, and soaked pea seeds; an asparagus plant, essentially leafless; mistletoe, seemingly rootless; and duckweed, seemingly stemless, Ricinus, and skunk cabbage seeds. Beside each plant or part a drawing supplies all the facts necessary to its interpretation. Structures are identified in appropriate colors.

Bench 2 is given over to representative gymnosperms. Branches, dissected male and female cones, and soaked pinion pine seeds are displayed on this table.

Bench 3 is devoted to Psilotum, the ferns and fern allies. Living plants and stages in the life cycle of a fern are presented here. Again cards are placed beside these materials providing the students with interpretive drawings.

In advance of the laboratory the staff prepares a list of questions so pyramided that the student is forced to go deeper and deeper into his problem until he can see the implications for it of his observed facts. This list is added to as questions are suggested by the instructor's experience, and some questions are discarded when they prove unsatisfactory. In the first laboratory the most important thing the student learns is that, given a problem and plenty of material, he is lost if he does not first analyze his problem. He has to know what to look for before he starts looking. The analysis expected in the first laboratory is that a category of organisms is identified by whatever the organisms have in common. Since this type of analysis was made in lecture in relation to the major problem, "Does Life Have A

Structure?," this is a test of how well the students can apply that experience in this new context.

EDITED TRANSCRIPT OF THE LABORATORY

"For this laboratory we have assembled on Table A representative angiosperms; on Table B, representative gymnosperms; and on Table C, representative members of groups we can identify as Psilotum and allies, the ferns and the fern allies. On the small benches at the back and at the side of the room there are batteries of dissecting microscopes, razors, in case you want to make dissections of anything, slides, and coverslips. These facilities are for those who see the need of them."

9:00 a.m. "The initial problem this morning is, What is an angiosperm? That's all, up and at it —you have 20 minutes."

9:20 a.m. "There is a red pencil at each of your seats. Jones—What do you have for us this morning, what kind of answer do you have?"

"Nothing, and frankly I don't know what you want."[2]

"It is not so much what I want—it is what the problem requires and specifically what this problem requires of you. Smith, what is an angiosperm?"

"An angiosperm, I'd guess, is any plant that has a flower."

"Does anybody have any other answer that he would like to volunteer?"

"Well, I don't know, but the literal interpretation of the word angiosperm means enclosed seed. How will that do?"

"It will do well enough, even though you may not know what it means—well enough so that for either flower or enclosed seed you can give yourselves 2/16 credit."

9:22 a.m. "But we want a careful, devastatingly complete answer. We want to be really convincing, so let us now go a little deeper. Why did you answer flowers? Why does the answer flower seem convincing? Take 3 minutes."

9:25 a.m. "If you have indicated that flowering plants or angiosperms or any category of things may be identified by what they have in common, give yourself another 1/16 because your analysis is correct."

9:30 a.m. "If angiosperms are those plants that possess flowers, you can of course draw and label the flowers of a willow, or of a dandelion, or of a poinsettia. If you have not done so, this is the time to do it. Take another 20 minutes."

9:50 a.m. "Your diagrams should look something like this. If your sketches have the essential structures on the blackboard, give yourself 3/16 or whatever fraction you deserve.

"Now that you have looked at flowers a little more critically, perhaps you would like to attempt another summary statement to the first problem."

9:55 a.m. "Pick up your red pencil again. All angiosperms have flowers in common but all of the flower that is common is a pistil and/or a stamen or stamens. Give yourself 2/16 if you have the substance of this in your statement, but be sure you have 'and/or' or its equivalent in there for 1/16 of the score.

"But did you ever ask yourself what a pistil is? A pistil did not just happen full-formed one fine morning with a nice cryptic label dangling from it announcing, 'I am a pistil'."

10:00 a.m. "In the demonstration materials before you there are two mutually supporting lines of evidence as to the origin and nature of the pistil. Take 10."

10:10 a.m. "What do you have, Brown?"

"I haven't got anything."

"Sarah—what do you have?"

"The pistil in the sweet pea flower under the dissecting microscope looks very much like the pea pod lying beside it. You have opened the pod, stretched it flat, and it looks to me as though a pistil might be a modified leaf, because the pod has a midrib and veining in it very much like a leaf."

"Good Girl. If you have anything like that give yourselves another 1/16th."

10:15 a.m. "But suppose someone replies. somewhat disrespectfully, 'So what?' What advantage can you see, to the plants that possess them, of pistils, a chambered structure and that structure attached to the plant?" Jim?"

"It holds the seeds; it protects the seeds."

"Protects them in what way and holds them to what advantage? This leads to the question—What is a seed? Take 20 minutes and see if you can come up with an answer."

10:35 a.m. "Sorenson. What is a seed?"

"Some seeds have endosperm, but not all. Some have seed coats, but not all. They all seem to have embryos. I would guess that a seed is a structure that possesses an embryo."

"Did you follow that? Give yourselves what fraction of 3/16 you deserve."

[2] Student responses italicized.

10:37 a.m. "What advantage to a plant can you see in a seed disposed in the way it is in an angiosperm? To get at this it might be well for you to compare seeds as you find them in angiosperms with a spore, another reproductive structure. A spore, and its place in the life cycle of a fern, is shown in the fern exhibit on Table C. You have 8 minutes."

10:45 a.m. "What is a spore? What do you have, Jones?"

"A spore is a single cell."

"But what does a spore produce? Take another 5."

10:50 a.m. "This is the last question. (1) What does a spore produce? This presupposes that you know (2) what a seed produces and (3) what advantage the seed habit has over the spore habit. Each one of these interrelated questions is worth a 1/16.

"A spore produces a gametophyte; a seed produces a sporophyte; the seed habit carried the plant through the relatively awkward gametophyte stage to a well developed sporophyte (embryo) in a relatively secure place, in the chambered pistil.

"We now have come up with something like a whole answer to our original question. Add up your totals and see what fraction of 1 or what fraction of a whole answer you got and multiply by 4. This is your grade for your first laboratory.

Laboratory II

The Life Cycles of Green Plants

In preparation for this laboratory the students have been given in lecture a typical or generalized life cycle. They have been told about the spore, the gametophyte, the gametangia male and female, the gametes male and female, the zygote, the sporophyte, and the sporangium. They have been told about mitosis and meiosis, about the haploid and diploid state, and they were shown, using an illustration from the fungi, how one can deduce a life cycle from a knowledge of a generalized life cycle. The fungus used by way of illustration is different enough from anything they will see in the laboratory so that the students must still discover their own life cycles.

The materials assembled for this laboratory illustrate the life cycle of the fern, *Polytrichum*, the liverwort, *Anthoceros*, the green alga, *Coleochaete*, and the blue-green alga, *Phormidium*. The stages in these life cycles are presented in as complete a fashion as possible, but they are *not* arranged in order. Drawings identifying the essential structures are laid out beside the mounts. Here again the students repeat the process described in the preceding laboratory. They look, check their answers, and look again.

A sample of the problems used for the second laboratory is as follows:

(1a) Draw the blue-green alga Phormidium and use whichever of the following seem appropriate as labels: spore, gametophyte, male and female gametangia, male and female gametes, zygote, sporophyte, sporangium.

(1b) Indicate why you chose the term you did above.

(2a) Under the words spore, gametophyte, etc., stretched across the top of two sheets of paper, indicate why you think the structure you have drawn is what you represent it to be.

(2b) Where does meiosis occur in this life cycle?

(2c) How do you know?

(2d) Where does karyogamy occur in this life cycle?

(2e) How do you know?

(3) Given stages in the Coleochaete life cycle, which are identified by letters A to F beside as many microscopes, arrange these letters in a proper sequence to represent a consecutive life cycle.

A Form Of Merit

"If a scholar, being poor, cannot help people with money but will on occasion wake up a man from his folly or save a man from trouble with a word of advice, that is also a form of merit."

—Chinese Proverb (translated by Lin Yutang).

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Integration and the Humanities

The people who write about education rarely seem to know what the humanities are for. Two English professors of the State College of Washington (Towne, at left, Ph.D., California; McNew, below, M.A., Washington State) urge that, in contrast to the scientific approach, our first concern with a work of art or literature is to appreciate its own unity. When this is done, the objects selected for humanistic treatment, each an integration in itself, are free to accomplish their own destiny, to produce their own effects.

By FRANK M. TOWNE
LOUIS D. McNEW

PERHAPS no term used in contemporary discussions of general education holds a more central position than *integration*. Fortunately the term seems to have the same general meaning for all who use it, denoting organization, coherence, unity. Yet innumerable differences appear in arguments urging integration or setting out plans for its realization, and these differences cannot be reconciled or even understood by a simple appeal to the dictionary meanings of the word; for the specific meaning of the term in a particular discussion and the consequent methods suggested for accomplishing integration are dependent upon more basic assumptions, often only implicit in the argument, about the nature of the matter to be integrated.

When the humanities are distinguished from the sciences in terms of the objects treated, when poems, plays, and pictures are held to be the proper subject matter for courses in the humanities, and when rocks, plants, and animals are the subject matter for integrations in the sciences, then the problem of how to integrate these materials seems the same for both the humanities and the sciences. What usually happens is that the scientist organizes his materials around a few clearly defined principles or laws, or around a generally accepted version of the scientific method, or he presents the history of the discovery or development of the laws or methods. He then challenges the humanist, or the humanist challenges himself, to discover in his materials the counterparts of the scientific principles, laws, and method. But the unity or organization does not come readily to the humanist. In seeking comparable "centers" of organization he merely opens up broader and more complex areas of difficulty. He usually ends, not with any real integration of materials, but with an arrangement imposed on the materials from without. He may settle for a chronological survey of great works, or he may attempt a history of the ideas derived from great works, or again he may present various kinds of works—art, music, literature, history, and philosophy. In any case he falls short of the apparent simplicity and internal organization achieved by his scientific counterpart.

These efforts at integration are determined and their success is limited by the conception of the nature of the humanities and the sciences and the nature of our contact with integrated knowledge. New efforts and new integrations become possible when this fundamental conception is changed.

Is there an essential difference of character between objects of scientific study and objects of humanistic study? We think not. We hold that there is but a single universe, and that this universe is available equally to the scientist and to the humanist. A work of art can be the object of scientific study and a physical phenomenon can be the object of humanistic study. The essential difference is not in the things studied, but rather in our manner of studying them; it is a difference in activities. It would follow, then, that our contact with integrated knowledge will not be the same in the humanities as in the sciences,

Centripetal and Centrifugal

The function of the scientist is to discover general laws—principles that describe the behavior of a maximum number of objects on which he fixes his attention. He makes such discoveries, of course, through induction. That is, he gives his attention to entities of a given class and studies them to find what they have in common. Thus every object that he deems worthy of his attention is in his mind a potential part of the whole struc-

ture of scientific knowledge that he seeks to erect. He studies nothing as a self-contained whole; the only whole with which he is concerned is the one that he himself constructs, or rather that he finds implicit in the nature of things. He is thus always moving toward integration, pushing forward toward a vision of the whole structure of the natural world. We might say that the movement of his effort is centripetal, proceeding from individual data toward higher and higher degrees of integration as he discovers more central and inclusive principles.

But for the humanist this whole order of things is changed. Every object that comes under his examination—a work of art, a history, a philosophy—is a whole entity, and he studies it to understand the relation between such an entity and the parts of which it is composed—in other words, to determine what is implicit in it. Instead of starting with a collection of potential parts and trying to integrate them, the student of the humanities customarily starts with an integration—poem, painting, string quartet, history, or philosophical dialogue—and endeavors to understand what it is that is integrated thereby. He wants to know as completely as possible what its implications are. Consequently, the movement of his inquiry is centrifugal, starting from the center of integration which the individual work constitutes and proceeding outward as far as possible in as many directions as possible.

Let us take Psalm 137 as an object of study:

By the rivers of Babylon, there we sat down; yea, we wept, when we remembered Zion.

We hanged our harps upon the willows in the midst thereof.

For there they that carried us away captive required of us a song: and they that wasted us required of us mirth, saying, Sing us one of the songs of Zion.

How shall we sing the Lord's song in a strange land?

If I forget thee, O Jerusalem, let my right hand forget her cunning.

If I do not remember thee, let my tongue cleave to the roof of my mouth; if I prefer not Jerusalem above my chief joy.

Remember, O Lord, the children of Edom in the day of Jerusalem; who said Rase it, rase it, even to the foundations thereof.

O daughter of Babylon, who art to be destroyed; happy shall he be that rewardeth thee as thou has served us.

Happy shall he be that taketh and dasheth thy little ones against the stones.

We note first that we have to deal with a rhythmic arrangement of words that play vividly upon the imagination and move us to an imaginative realization of the experience of the captive singer—his homesickness, his lack of heart for song, his bitterness against the cruelty of his captors. The time, the place, the person—these are immaterial; we recognize the validity of the experience as a universal theme. We are in the presence of poetry. But have we exhausted the implications of the psalm when we have studied it as a poem? Certainly not. For it can be read, if we choose, as a bit of history—the cry of a particular captive led out of Judah to Babylon in the days of Nebuchadnezzar, perhaps the record of an actual request from a Babylonian woman for him to sing her one of the songs of his homeland. Morever, we can pursue the ethical implications of the psalm and find in it the expression of a notion of justice not tempered by mercy. Or we can perhaps consider its implicit metaphysic, noting the writer's belief in the divine justice that he apparently believes will ultimately overtake his captors. Possibly we can even dwell upon what the psalm implies of the relation that should exist between the citizen and his country, especially when he finds himself a prisoner of war.

What should be noted about the activity engaged in here is that there is no effort to integrate knowledge, such as the scientist's effort to arrange his data in more and more inclusive patterns. The movement here is quite the opposite. Integration is present at the start, in the form of the psalm, and the task of the student is to discover what, indeed, this integration consists of. Instead of rolling up knowledge into a larger and larger ball, he starts with such a ball and unrolls. There is a continual enrichment of his experience with the psalm as he unfolds layer after layer of its implications—poetic, historical, ethical, metaphysical, political. Thus, far from being treated as a part of some larger entity, the psalm is itself regarded as an entity consisting of half a dozen or more potential entities within it. It can perhaps be compared to a crystal breaking into many smaller crystals each of which retains the symmetry of the original. Or, more accurately, since there is really no fragmentation involved, it is like an unusually complicated, many-sided version of the classic drawing of reversible steps, which, according as one looks at them now in one way and now in another, appear to be right side up or upside down.

Scientific and Humanistic Study

Quite different from this approach is the scientific study of what are usually considered to be "humanistic" objects. The philologist, we all recognize, uses works of literature as a quarry in

which he digs for samples of the forms and meanings of words to the end that, when he has amassed sufficient evidence, he can generalize from it and tell us what the state of a language was at a given time. Quite frankly, he is a student of language rather than of literature, with which his connection is purely fortuitous; in his capacity of philologist he has no concern with a piece of literature as an entity or even as a part of a larger entity. On the other hand, the scholar who counts feminine endings and run-on lines in the verse of Shakespeare's plays with a view to determining the poet's development in prosody, and possibly with a view to dating some of the plays, is interested in each play as a part, but only as a part, of an entity—all the plays of Shakespeare—which he tries to see as a prosodical development constituting a single unit. The student of literary, musical, or sculptural types, again, though he is interested in whole works, is interested in them only as members of a class—consequently as parts rather than as entities. A play is of interest to him as a member of the class tragedy or of the subclass domestic tragedy or of the hybrid class tragicomedy. His activity is the exact parallel of that of Linnaeus and his successors, who, faced with a given plant, either recognized it as a member of a known species and genus or invented the name of a new species and possibly genus to which it could be said to belong.

All this is scientific thinking about objects that we usually regard as belonging to the humanities. Conversely people think humanistically about natural objects that are regularly the subject of scientific study. Whitman does this when he writes:

> A child said *What is the grass?* fetching it to me with full hands,
> How could I answer the child? I do not know what it is any more than he.
> I guess it must be the flag of my disposition, out of hopeful green stuff woven.
> Or I guess it is the handkerchief of the Lord,
> A scented gift and remembrancer designedly dropt,
> Bearing the owner's name some way in the corners, that we may see and remark, and say *Whose?*
> Or I guess the grass is itself a child, the produced babe of the vegetation.
> Or I guess it is a uniform hieroglyphic,
> And it means, Sprouting alike in broad zones and narrow zones,
> Growing among black folks as among white
> Kanuck, Tuckahoe, Congressman, Cuff, I give them the same, I receive them the same.
> And now it seems to be the beautiful uncut hair of graves.

What Whitman does in thinking about the natural object grass is exactly what we have done in thinking about Psalm 137. He explores its implications for poetry, for his own character (this is history), for metaphysics ("the handkerchief of the Lord . . . designedly dropt"), for social philosophy and ethics (with emphasis on equality), and even for epistomology (in his first bewilderment at the child's question and in his subsequent *guesses*). He does not, through a study of organic structure, attempt to classify the grass, or kinds of grasses, according to genus or species. The grass never becomes for him a specimen, a member of a class, but always remains an entity, no matter how great the variety of implications he finds in it.

Each Unit Itself a Whole

Since each object of study in a humanities course is an independent centrifuge, the student's progress cannot be conceived, as in the sciences, in a linear fashion—unless perhaps the course is devoted to the study of a single book or work of art. The object under examination by the scientist at any given time is only a specimen part of the potential whole that he hopes to comprehend when he has all the parts assembled, so that he naturally moves along from part to part, from subdivision to division to whole, increasing his knowledge of the entire entity as he moves inward, from all points on the periphery, toward the master principle that is central to that entity. In the sciences a whole course, or even a series of courses, may thus constitute a single progress from one point on the periphery, or perhaps converging processes from several points, toward the center.

But in the humanities there can really be no such assembling of all the books in the curriculum to form a single whole, governed by an all-inclusive generalization. Since each book or work of art in itself constitutes an entity, there is no linear progress from the beginning of the course to the end. Instead, there is a series of attempts to move outward from a number of different foci in as many directions as is fruitfully possible. If a student fails to proceed in many directions or very far from the first focus, he has not missed a prerequisite which he must complete before moving on to the next focal point. For the book or work of art which constitutes the next focus is a separate entity, and although it may have much in common with the first object of study, the two are not interdependent. Either one of them can be explored without reference to the other, and consequently either one of them can come at any point in the course, from beginning to end.

In practice, there is perhaps something to be said for placing what seem to be the less complex works at the beginning of the course and the more complex works toward the end, though such an arrangement implies that the instructor has himself exhausted all these complexities and can speak with a kind of divine authority—an assumption that almost any honest teacher will throw to the winds after engaging in an hour's discussion with an intelligent class. Even an apparently simple work, if one's point of view be suddenly shifted under the stimulus of a Plato or a Collingwood, may reveal complexities such as one was hardly aware of even in a *Divine Comedy*. An alternative to arrangement by supposed degree of complexity is to treat the individual works in chronological order. This practice has the advantage of making certain things clear for the student at the mechanical level of explication de textes. The reader of Lucretius, for example, knows the circumstances of the Athenian plague if he has already read Thucydides; the reader of Dante knows who Vergil was and why Dante might have been interested in him if he has already read the *Aeneid*. Morever, the student may develop as a byproduct of his study an elementary but very useful notion of the order of things in human history. The danger of this arrangement is that the wisdom of chronology may be bought at too great a cost—that the course may, in fact, lapse into a survey of civilization. When that happens, the books and works of art which were to constitute the individual foci from which exploration was to proceed lose their independence as seminal works and become subordinated to a single purpose. Liberal education then ceases; and the student finds himself memorizing what Alfred North Whitehead called "inert ideas"—"that is to say, ideas that are merely received into the mind without being utilized, or tested, or thrown into fresh combinations." (*The Aims of Education*, Chapter 1.)

Whatever order is adopted, it must not be allowed to interfere with the integrity of any of the works to be studied in the course. It must not subordinate them to any master plan. In fact, the nature of integration in the humanities, as we see it, is hostile to the very notion of a "course," a cursus, a reduction of individual objects of study to the status of parts of an organized cycle or whole. Integration in the sciences, to be sure, even in the science of aesthetics, is to be achieved in the cursus way. But the peculiar benefits that a study of the humanities has to offer, the greatest of which—and perhaps it includes all the others—is Socratic self-knowledge, are inevitably lost when the humanistic works that we expect to confer these benefits are deprived of their independence—deprived, in other words, of the liberty to confer them.

Consequently, the only essential relation that one unit of work in the humanities course bears to another unit is that of similarity. There is no prescribed "progress" from one unit to the next, for any of the projected units can occupy any place in the order of the course. The whole course, indeed, is implicit in every unit. "Progress" is conceived of, not as a movement from one piece of knowledge to another in a single direction, but as an expanding total awareness to which it is hoped that each of the works studied in the course will contribute. The contribution of each work depends, not upon its occupation of a necessary position in a prescribed architectonic scheme, but upon the intellectual and emotional maturity of the individual student, who responds to it as he is temporarily able to respond to his lifelong effort to form his own vision of an architectonic scheme embracing the entire universe.

In the minds of many educators, unfortunately, the word *humanities* has become linked especially with the notion of transmitting the cultural heritage from one generation to the next. This connotation of the word is all right, as far as it goes, but it becomes a liability when it chokes off all other connotations. For how, after all, can a course in the humanities claim to transmit the cultural heritage any more than a course in physics? Such transmission is, by the very nature of the thing, characteristic of all education. To claim it for the humanities is to ignore the very great contribution which courses in the sciences and in mathematics make every day in handing on to younger generations the thoughts of Boyle, Newton, Mendel, Pasteur, and Euclid. If courses in the humanities have no function but to hand on the heritage of the past—a task which other courses perform without fanfare as an inevitable part of their routine—they are indeed in a bad way. It is difficult to see how they constitute more than a tissue of "inert ideas," governed perhaps by one master inert idea.

As a matter of fact, educators seem hard put to it to know what to do with the humanities. The subjects we call the humanities are with us—they have been here for a long time—but the peo-

ple who write about education rarely seem to know quite what they are for. Even Whitehead, after the splendid introductory essay in *The Aims of Education,* in which he inveighs against 'inert ideas,' can find nothing better, in his chapter on "The Place of Classics in Education," than to assign to the classics, Greek as well as Latin, the role of conveying to the student the "vision of Rome," the vision of the civilization which organized ancient cultures and out of them formed the stuff of which modern civilization is woven. In other words, he himself proposes a mammoth inert idea, enslaving to it all the classics of Greece and Rome that the student has time for. These classics are not to be read, presumably, as works that will sow in the student's mind the seeds of ideas. For the idea has already been determined—"the vision of Rome"—and there is nothing more to do but read the classics in illustration of it.

Contribution of Humanities Unique

We doubt if the vision of Rome is worth purchasing at this price. The reading of Homer, Euripides, and Plutarch, in addition to Lucretius, Vergil, Horace, and Cicero, may indeed help us to get an idea of the part that Rome has played in the history of civilization; but if it does no more than that, the student surely has reason to complain that his time has been ill spent. How much richer an experience he is likely to have if the instructor gives each one of these works its freedom and lets it suggest ideas to the student and to himself, rather than tying it in a bundle with other works as an illustration of some cherished preconception. Only by being released from such service, which it is in any case ready to perform at need, can the individual work operate as more than a specimen part of a projected totality that may prove, on examination, to be nothing more than an inert idea. To use a book primarily for purposes of illustration is to put it in a subordinate position with respect to the idea that the instructor wishes to illustrate. Many books, we are only too eager to grant, can best be made use of in this fashion. But we submit that any book meriting the name of classic merits it by virtue of having exhibited, over and above the mere illustrative worth that any book possesses, an especially heightened capacity for sowing ideas in the minds of men. We think, in other words, that the greatest value of these books is seminal rather than illustrative, and that they can best be studied, consequently, as individual entities throwing out many branches rather than as subordinate parts of a calculated plan.

Our efforts here to describe what we think is the essential nature of the humanistic activity and to suggest the benefits which may be derived by both teachers and students from conscious participation in that activity do not imply that teachers in "integrated" humanities programs should invent new schemes for their courses or even select different works for treatment in those courses. We would hope to accomplish, however, the awareness on the part of humanists that their activity does differ essentially from that of scientists and in its own right makes a necessary and unique contribution to the education of students. And while we assert the value and importance of the humanities when thus regarded, we do not challenge the value of the contribution of the sciences nor contend with them for first or second place. We hope only that humanities teachers, aware that the humanities are not "scientific," may, in good conscience, abandon the search for a scientific organizing principle. When this is done, the objects selected for humanistic treatment, each an integration in itself, are free to accomplish their own destiny, to produce their own effects.

Summer Issue

The Summer 1958 issue, mailed in June, will feature *television teaching* with special articles by W. J. McKeachie of the University of Michigan, James V. Mitchell Jr. of Purdue University, and Robert Nossen of Lamar State College. Other articles will be: "Teaching and the Realities" by Aldous Huxley, "The Dialogue" by Winslow R. Hatch (continuing his series), "Oliver Wendell Holmes Teaches Anatomy" by Robert L. Coard of the University of Alabama, and "Neglected Purposes of Higher Education" by John E. Horner of the University of Omaha. Editorial: "Pantograph."

The Teaching of Adults

Teaching adults can be a challenge to a professor. To his mature students his teaching must be challenging. From long experience in college teaching, special experience and study in adult teaching, and immediate occupation with an experimental study of adult education, the acting director of the Brooklyn College school of general studies (A.B., Brooklyn College; A.M., Columbia; Ph.D., New York University) presents significant aspects of the needs and capacities of adult students. Author of books in both literature and administration, he is at present writing a book on adult learning and teaching.

By BERNARD H. STERN

MORE AND MORE adults are turning up in college classes these days in belated pursuit of a baccalaureate degree. Many of them, between the ages of 35 and 55, have already made their mark in the world. By virtue of their maturity, intelligence, and impelling motivation they stand out from their younger undergraduate classmates. A large number of them found their formal education interrupted during the depression of the '30's by the necessity for going to work instead of to college. They are returning now to finish what they had to defer, and their determination to earn a degree at their age is induced not so much by the wish for advancement on the job as by a genuine desire to learn. They want to understand the present state of man's knowledge in the arts and sciences so that they may be better able to fulfill themselves as human beings.

Adults are different from young undergraduates. They have had more life experience, of a different kind from that of youngsters, and differently organized. Such experience has for adults involved change, direction, and challenge over a long period of time. These have resulted in personal growth and purposive development through the necessity for overcoming barriers, pressures, and taboos. In other words, adults have already been partly educated by life. Subjected to traditional teaching techniques, they find themselves cramped by tedium. They maintain that they already know much of what they are required to learn, that they can proceed faster than the prescribed pace, and that customary undergraduate assignments present insufficient challenge to them. They assert that, in the regular college pattern, they are subjected to classroom experiences that are inappropriate to adults. They have noted undue stress on memorization and grading. They feel that in the classroom they are constantly "told" what to do, say, or think rather than stimulated in their thinking. Instruction, they maintain, should rely on adult techniques of study, such as research projects and concrete examples of the application of knowledge and theory. If classroom teaching included more techniques of this sort, the level of their educational achievement would be raised.

Three years ago an experimental degree project for adults was begun at Brooklyn College in response to these criticisms, with a subsidy by Chicago's Center for the Study of Liberal Education for Adults. A special faculty committee was empowered to experiment with a rigidly screened group of highly qualified adults in order to determine how much adult experience counts in a liberal education. When efforts were made to equate experience with college courses, it was found that many adults could demonstrate mastery of the objectives of specialized elective courses, such as World Trade, but that they lacked sufficient training in the broad, theoretical aspects of a liberal education such as are provided by prescribed courses. On the other hand, adults did possess some of the objectives of prescribed courses, such as skills, values, and understanding. It was, therefore, possible to accelerate and deepen their study in these courses by a combination of tutorial service and independent reading. They could meet with a professor four or five times during a period of several months for guidance, stimulating discussion, and evaluation, but they could carry the main burden of work on their own with considerable profit.

Further experience with these tutorial methods revealed that the adults profited more from group study than from independent reading. They wanted to meet with their tutors at more frequent intervals, preferably weekly. They were irked by the multiplicity of standard course examinations, which they found too taxing on ener-

gies that they preferred to expend on more vital educational experiences. They were eager for more personal contact with the faculty. They welcomed instruction, but wanted less of the "detailed" and more of the "comprehensive." They recommended setting up interdepartmental, integrated tutorial seminars.

Capitalizing on Adult Experience

It seemed clear to the committee from these expressed wishes that the teaching of adults should capitalize on adult experience and abilities by (a) reordering the materials in the various fields of knowledge to meet adult needs and (b) stimulating the adults to do for themselves much of the work which teachers think they have to do with younger undergraduates. It would then not be necessary to lead them step by step through all the specific details of the content of standard courses. They could, instead, be assigned extensive readings and other study projects, class meetings being devoted to the major problems, issues, and concepts around which the objectives of the courses centered. The repetition and amplification of assigned readings which constitute much of the "lecturing" in college classes could be left for the adults to master independently.

In 1956 four such tutorial seminars specifically for adults were introduced into the curriculum as alternative equivalents to all prescribed courses for the baccalaureate degree. These seminars, extending over a period of two to four semesters, were in Communication, Humanities, Social Science, and Mathematics-Natural Science. They were comprehensive and integrated at a sufficiently high level of scholarship to permit adults to build on what they had learned from life experience. Among the objectives of these seminars were these:

- **Critical thinking and effective communication.**
- **Making explicit the student's personal value system.**
- **Understanding the nature of man and society, particularly contemporary society in the United States.**
- **Creating aesthetic awareness.**
- **Insight into the nature, content, and methods of modern scientific knowledge and understanding of the relationships between the sciences and other aspects of Western culture.**
- **Liberation of personality by awakening awareness of valid patterns of cohesion and harmony in the humanities.**

The Communication course was conducted concomitantly with the Humanities seminar. It dealt with the principles and practice of reading, writing, listening, and speaking. Communication skills were studied in connection with papers and reports prepared in the other seminars. The course included orientation to college study, remedial communication, and detailed analysis of the principles of effective communication in the various media.

The Humanities course used materials from the fields of literature, painting, sculpture, architecture, and music to study the intention of the artist, the art object as metaphor, the concept of order, the transformation of nature, the artist's vision of reality, and the historical perspective of art. In the first semester the adult mastered fundamental concepts in the humanities at first hand. In the second semester he made a historical survey of the humanities from the Greeks to the present. In both semesters there was a long reading list for independent study.

The Social Science course was a functional analysis, historically oriented, of social phenomena and the cultural roots of social values. It included an introduction to social science, the nature of personality, society, contemporary American society, socialization, and critical issues. For each of these topics the adults were provided with an extensive bibliography. The seminar extended over two semesters. The primary method used was group discussion.

The Mathematics-Natural Science seminar covered four semesters. It was concerned with the interplay of science, mathematics, and philosophy and included such topics as mathematical concepts and techniques, chemical properties of matter, earth structure and history, motion and energy, atomic structure, functions of living organisms, and inheritance and evolution. Workshop and laboratory sessions were included with lectures and recitations.

Adult Initiative and Creativity

Because classes were composed exclusively of adults possessed of a rich background of experience, it was possible to use classroom methods which relied upon adult initiative. In the Humanities and Communication seminars a period of three weeks was devoted to the subject of "The Religious Spirit," an exploration of the Middle Ages. Each member of the seminar was given a phase of the subject to investigate independently and to present to the class orally during a series of panel discussions. These phases included Hebraism, Christianity, History, Everyday Life, Trade and Commerce, Science, the Arts, Music, and Literature. In subsequent sessions the group as a whole analyzed the reflection of all these phases of the Middle Ages in biblical, musical, and art materials. Their learning culminated in a critical study of Dante. Similar approaches were made to the understanding of the Greeks, the Romans, the Renaissance, the 17th and 18th Centuries, Romanticism, Realism, and Naturalism.

The advantages of this method included not merely a marked degree of active student participation but the extended practice of the two fundamental skills in the academic process: the accumulation, assimilation, and organization of data and their oral presentation to others. This method also provided opportunities for adults to learn more deeply, independently, and in less elementary fashion.

Another device employed in Humanities and Communication was the workshop. This method is based on the conviction that aesthetic ideas are concepts which may best be grasped by intuition. Adults do not have time for the study of mediocre works. Instead, they should be actively involved

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in the aesthetic process and its materials. In an easy and informal atmosphere they try their hand at actually creating, let us say, a color passage, using construction paper and paste, designed to evoke a feeling of buoyancy or constraint in the spectator. They write character sketches. They compose melodies and proceed to vary them, changing the tempo or the rhythm or the key. They work with wire and solder to articulate space. In these ways they become involved and begin to recognize aesthetic ideas before they are discussed. Then they recognize solutions to their own problems in the reproductions they see, the literature they read, or the music they hear. They will not be frightened by Kandinsky, having struggled to articulate space by using only color and shape and thrust.

Workshop projects were devised to focus attention on the concept, concentrating on one specific problem and the perception of its resolution in the art object. In the adults there was a sense of accomplishment which relaxed them sufficiently to enable them to tackle vastly difficult art objects without trepidation. On three occasions they worked with construction paper and rubber cement on a baseboard. The first time they concentrated on color, the second time on pattern, the third on three-dimensional space. Later, in considering the concept of style, there was a fourth workshop in which the task was to cut vase contours. Each adult was asked to cut, free hand, three vase shapes that were as different as possible. When the constructions and vase contours were compared, it became evident that each adult had a definite style. The identifying characteristics were found to be not verbal, not psychological, but aesthetic. What distinguished each style were the colors chosen, the kinds of shapes cut, the quality of line, the devices used to achieve pattern, and the kind of harmonious relationships that satisfied the maker.

After these workshops the adults examined reproductions and were able to specify what distinguished Matisse from Picasso or Van Gogh from Gauguin. Once they understood something of Picasso, Hopkins could be read with insight and Stravinsky became accessible, for to the adults all of these, despite their different art media, were communicating truths about their own nature and experience.

Classroom procedures specifically for adults were also followed in the Social Science seminar, which was conducted by two professors, one of whom presented social science concepts while the other acted as critic and discussant alternately. This presentation was followed by lengthy group discussion centering around the critical questions raised by the professors, one of whom was a psychologist and the other a political scientist. On occasion they were joined by guest professors from such departments as history, sociology, biology, and philosophy. Because of their extensive life experience, the adult students could bring to these discussions their own fruitful interpretations of social problems such as labor-management strife, racial prejudice, international conflict, and so forth. After this motivation, they were directed into an extensive reading program. Supplied with a thorough bibliography, they were able to carry on this study on their own initiative, leaving class time free for stimulation and guidance.

The effectiveness of this kind of teaching is predicated upon adult experience. As students in general do, adults often exhibit biases and preconceived notions. But their extensive family, social, and community experiences provide them with points of reference for the relation, testing, and evaluation of concepts and principles which they are taught. As a result, when you are teaching adults, these concepts are intensified in meaning and the experiences reinterpreted in their light. As one of the adults wrote after completing the seminar:

> During the 25 or 30 years since I got away from disciplined study, I did considerable independent reading: history, literature, biography, economics, political science—but everything was entirely unrelated, one to the other. For the first time I now see how writers in all these fields are the products of their eras. I see how closely integrated are the thoughts of physical and social scientists, the points of view of philosophers, creative writers, and musicians. Things are beginning to become ordered in my mind; the developments of thought and creativity fall into their proper places.

Adult learners are quick to respond to their own rich and varied world when it is held up to them. They have the will to achieve insight into the meaning of the numerous events that have occurred to them in the course of a lifetime. At their age it is important for them to conserve time. Classroom experiences for them must be pregnant with implication. It should be recognized that their life experience has not been shrugged off. It is there and is meaningful in an academic setting. But their experience has not been given form, and this is what they must be taught.

New Directions for the University

NEW DIRECTIONS FOR THE AMERICAN UNIVERSITY by Frederick Mayer. Introduction by Aldous Huxley. Washington, D. C.: Public Affairs Press. 1957. vii + 52 pp.

EDUCATION FOR THE GOOD LIFE by Frederick Mayer. Introduction by Richard Neutra. Washington, D. C.: Public Affairs Press. 1957 v + 123 pp. $2.50.

EDUCATION FOR MATURITY by Frederick Mayer and Frank E. Brower. Introduction by William H. Kilpatrick. Washington, D. C.: Public Affairs Press. 1956. vi + 155 pp. $3.25.

Right now the ivory tower is no place for a philosopher or any of the rest of us. The purpose of thinking is to decide action. The function of philosophy, or its chief function, is to guide action, to help in charting the lives of men and nations. Frederick Mayer, professor of philosophy at the University of Redlands, author, and creative thinker, sees a golden age in education, perhaps even brighter than the Renaissance and the eighteenth century. It depends upon us:

> We shall set the pattern for other nations and we shall demonstrate that millions more in other countries are eligible for higher education. This is real humanitarianism. This is the type of leadership which is desperately needed in the atomic age. Ours is indeed a fateful choice: we can choose the status quo and develop along mediocre patterns or we can be audacious and create a truly creative system of education.

The vision of the author of "New Directions for the American University" goes beyond such considerations as narrowing the gateways to keep out some of the students who want higher education or enlarging classes in order to accommodate them. He advocates the creative handling of current problems and in his book demonstrates the creative spirit.

He is concerned with the prevalence of anti-intellectualism on campuses but does not necessarily admire the intellectual our universities produce. The intellectual in most cases, he says, "is simply an objector who looks down on the Babbitts and the men of success with unmitigated contempt and he tends to be a specialist among specialists." But the problem of anti-intellectualism must be faced:

> There is no exit from our materialism and our utilitarian goals. . . . Yet we face a supreme temptation in a materialistic culture and we are succumbing to it. We underrate the individual, we underestimate the importance of teaching; we put our trust into big buildings and treat the instructors like janitors with a degree. We confuse between efficiency and greatness. We are motivated by numbers. We produce higher institutions of learning where learning plays a secondary, even a tertiary role. We produce thousands of students who have never felt real intellectual excitement and thousands of others who graduate with a distaste for the liberal arts and the intellectual.

The deadly sin of higher education, says Mayer, is smugness. His book should arouse us. Many of the sentences might be developed into chapters: "It is more important to be suggestive than to be correct." "Education is the laboratory for our ideas." "Specialization is only the prelude to real learning." "Science without poetry is an excursion in a mathematical wasteland."

Let us as teachers by all means read this book. We need to realize the serious problem of higher education today and tomorrow, a problem that will not be solved unless we participate in the solution. Aldous Huxley in his introduction says: "No system of education can be better than the men and women who put it into practice." Each of us needs to know the direction that higher education ought to take and we need to help.

We can equip ourselves for a larger part in our present and future by further reading of Frederick Mayer whom Richard Neutra compares to Thoreau. "Education for the Good Life" is concerned with the search for reality. "As we become more analytical, we realize that man creates his own Universe, his own Heaven and his own Hell. It is imperative to know the moral laws of man." "We must be realists with a sense of poetry and dreamers with a sense of actuality."

In the earlier book "Education for Maturity" written with Frank E. Brower we find seventeen chapters which Kilpatrick declares will cause readers to think. For example: "The faith of the liberal rests upon the sanctity of the individual. Society exists for man, not man for society. Salvation cannot be found through collectivism, through blind conformity to group standards; but only through the full intellectual, esthetic, and spiritual development of the individual. In education this implies an emphasis on the individual student."

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